

TROJANUVFLEX™ AOP

# Reuse & Remediation

TROJAN  UV™

 Water  
Confidence™



## Producing High-quality Drinking Water with UV Advanced Oxidation

Meeting the demand for clean water has never been more challenging. Communities around the world are facing a growing water stress – in terms of water quality or water quantity – and often both. Many are relying on more advanced treatment methods such as UV Advanced Oxidation Processes for drinking water remediation and potable wastewater reuse in order to overcome these challenges and meet demand.

The UV Advanced Oxidation Process (also known as UV AOP) can help municipalities relying on lower quality water sources to continue producing high-quality drinking water for their communities. UV AOP does this by destroying a range of environmental contaminants while simultaneously providing final disinfection to inactivate bacteria, protozoa and viruses.

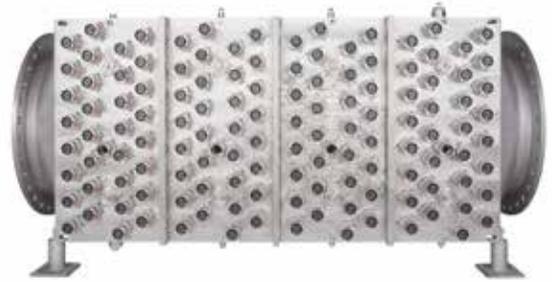
TrojanUV advanced oxidation systems are installed in both reuse and remediation applications treating a variety of contaminants such as 1,4-dioxane, taste and odor causing compounds, NDMA, and pesticides. With decades of experience in the design of UV AOP systems and dozens of full-scale installations around the world, Trojan is a global leader in the application of UV AOP technology.

## Compact, Eco-efficient UV Advanced Oxidation

The TrojanUVFlex™ AOP is our latest innovation for UV AOP treatment and is designed with features to make installation and operation simpler, faster, and more cost-effective than ever before. Built on our proven Solo Lamp™ Technology platform, TrojanUVFlex AOP allows for energy-efficient high-intensity delivery of UV light in an extremely compact footprint. Advanced controls, monitoring, and validation enable municipalities to provide Water Confidence™ to their customers.



TrojanUVFlexAOP 200 Series



TrojanUVFlexAOP 100 Series

**Cost-Saving Cross-Flow Lamp Orientation.** TrojanUV Solo Lamps are arranged in arrays engineered to minimize cost. Perpendicular cross-flow lamp orientation reduces operating costs by allowing independently operated sections of lamps to be turned on/off in response to changing treatment conditions and also ensures water continues to be treated by downstream lamps in the event an upstream lamp needs to be replaced.

**Future Expansion Made Easy.** Chambers can be manufactured with additional banks to accommodate future treatment capacity. This ensures the system meets your current requirements while also planning for future needs.

**Advanced Sleeve Cleaning.** Automatic mechanical sleeve wiping system maintains maximum UV output and is available for even our largest UV chambers. Replacing worn wiper seals is quickly and easily accomplished from outside the UV chamber.

**Low Footprint with Flexible Installation Options.** With up to 1,000 Watts of available power per lamp, the lamp count and chamber size is greatly reduced for UV AOP applications. The option to install chambers vertically or horizontally makes integration into existing piping straightforward and allows service access from any direction.

**Advanced High Dose Validation.** Chambers are validated across a wide range of treatment conditions in accordance with the National Water Research Institute (NWRI) and United States Environmental Protection Agency's Ultraviolet Disinfection Guidance Manual (UVDGM) for inactivation of *Cryptosporidium*, *Giardia*, viruses, and other pathogens. The TrojanUVFlex AOP can be designed to meet your contaminant treatment requirements while simultaneously providing high-intensity UV disinfection including up to 6-log credited virus inactivation, in almost any treatment environment.

## UV Chamber

A stainless steel chamber houses the lamps and quartz sleeves in a unique cross-flow orientation. Its design has been optimized for highly-efficient treatment in a very compact footprint. Precise UV intensity sensors monitor lamp output optimizing power use and reducing overall energy consumption.

## Sleeve Cleaning System (Optional)

Our mechanical sleeve cleaning system removes fouling to ensure the maximum amount of UV light enters the water and is available for treatment. It works automatically, without operator involvement, without draining the UV chamber, and without disrupting treatment. Wiper seals can be replaced easily from outside the UV chamber.

## TrojanUV Solo Lamps

The TrojanUV Solo Lamp combines the benefits of low- and medium-pressure lamps, providing high UV output, low power consumption, low lamp count, long lamp life (>15,000 hours), and reduced maintenance. Lamps are located within protective quartz sleeves and are easily accessible for change-outs.



## Power Distribution

The compact power distribution panels house rack mounted Solo Lamp drivers to power and control the UV lamps. To reduce power consumption and save costs, drivers control lamp sections which turn on/off based on real-time treatment conditions and can dim lamps from 100 to 30% power. They feature built-in diagnostic capability for easy troubleshooting and take only minutes to replace.



## Local Control

A local control panel houses the UV controller which maintains the customer desired contaminant treatment through real-time input signals for flow, UVT, and UV intensity. Performance is carefully monitored with return signals being sent to lamp drivers and oxidant injection pumps which adjust both UV output and oxidant dose to maintain cost effective operation.

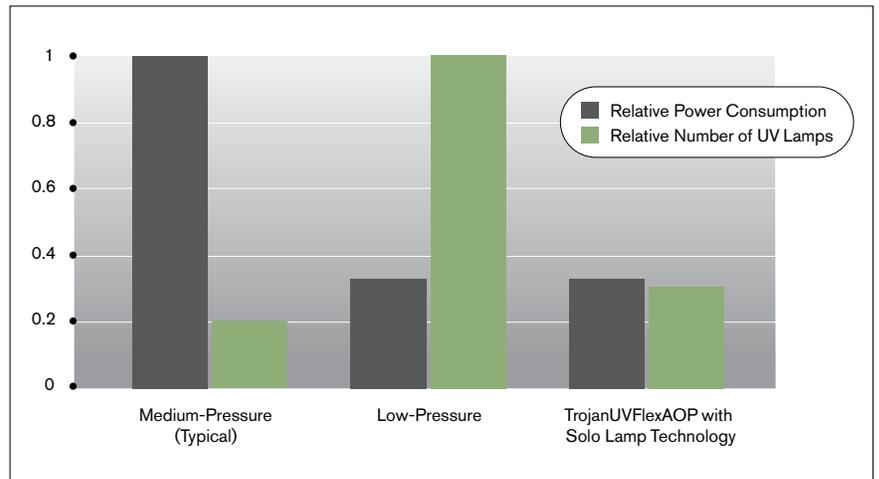


# Revolutionary Lamp and Driver Technology



The best features of both low- and medium-pressure lamps

- High UV output and high electrical efficiency
- Low total lamp count (and associated components like drivers and sleeves) reduces maintenance costs
- Long lamp life (15,000 hours guaranteed)
- Solo Lamp driver has a high power factor and low total harmonic distortion
- Lamp drivers are rack mounted in panels for compact footprint and easy replacement



*TrojanUV Solo Lamp systems combine the benefits of other lamp technologies – the low lamp count of medium-pressure systems with the high electrical efficiency of low-pressure high-output (LPHO) systems. The result is a compact, cost-effective installation that is easy and quick to maintain.*

## Compact, Modular UV Chamber

Significantly reduces footprint and installation cost

- Staggered, cross-flow lamp arrays maximize UV output and reduce chamber size
- Compact footprint simplifies indoor retrofit installations and reduces construction costs
- Horizontal or vertical installation allows service access from any direction
- Modular lamp sections enable expandability, redundancy, and low power consumption
- Low headloss design reduces or eliminates pumping

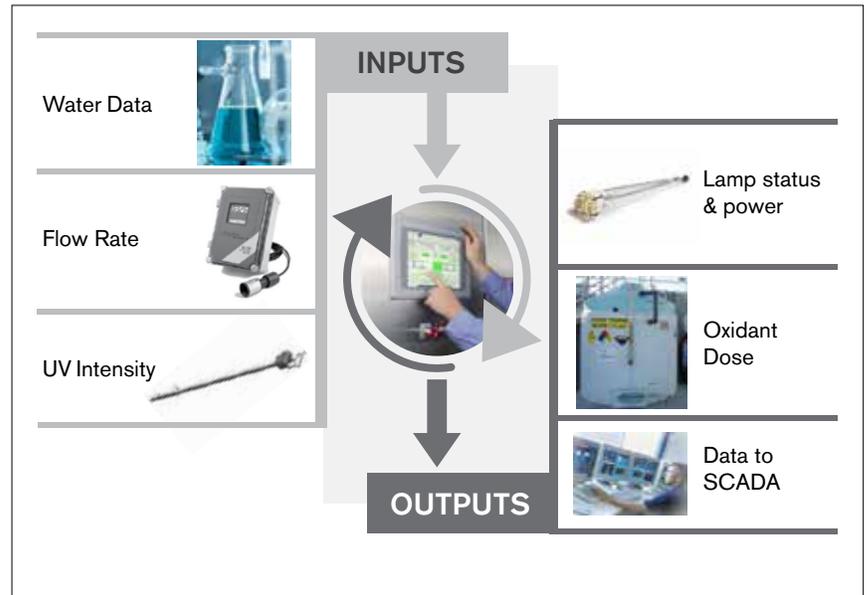


*The chamber has been designed for high intensity delivery of UV light in an extremely compact footprint.*

# State-of-the-Art AOP Control System

Confidently achieve treatment objectives while minimizing operational costs

- The advanced UV AOP controller processes multiple real-time inputs including flow rate and UV transmission
- Critical water characteristics including scavenging demand and alkalinity as well as other system parameters such as lamp data are all computed together to evaluate real-time performance
- Computes delivered contaminant reductions with either hydrogen peroxide or free chlorine oxidants and compares performance against desired treatment requirements
- Optimizes energy use by modulating UV output and oxidant delivery to match treatment conditions
- Displays Critical Control Points through SCADA and local and/or remote HMIs



*Real-time inputs are utilized in the computation of contaminant destruction. The system dynamically adjusts lamp power and oxidant dose to minimize operation and maintenance costs.*

## User-Friendly Experience

Designed to make the operator's job easier

- Access lamps, UV sensors, and quartz sleeves all from the outside of the chamber
- "Lamp on" LED indicator on lamp plug provides easy visual determination of lamp status
- Optional mechanical sleeve cleaning system prevents quartz sleeve fouling
- Wiper seals are quickly replaced from outside the UV chamber
- Integrated chamber hatches provide easy access for internal inspection or maintenance
- Graphic screens and icons make system operation intuitive for operators



*All UV systems require periodic maintenance; but TrojanUVFlexAOP allows fast access to all routine maintenance components (including wiper components) from outside the UV chamber. This minimizes maintenance time and increases efficiency.*

# Building Water Confidence

The TrojanUV line of products include open-channel and closed-vessel UV disinfection systems for municipal wastewater and drinking water, as well as UV advanced oxidation systems for the treatment of chemical contaminants in water. We have the largest municipal UV installation base in the world and are proud to play an important role in continually advancing UV disinfection technology and helping to build Water Confidence for communities and municipalities.

**Experience.** Over 10,000 municipal UV installations; treating 60 billion gallons of water every day (225 million m<sup>3</sup>/day).

**Global Support. Local Service.** Our comprehensive network of certified service providers offer rapid response and personalized attention for service, replacement parts and system optimization.

**Guaranteed Performance and Comprehensive Warranty.** TrojanUV systems include a Lifetime Disinfection Performance Guarantee\* and comprehensive warranties for systems and parts.

System Specifications		
System Characteristics	TrojanUVFlexAOP 200 Series	TrojanUVFlexAOP 100 Series
Lamp Type	TrojanUV Solo Lamp - Low Pressure High Output	
Lamp Power	1000 Watts	500 Watts
Lamp Driver	Electronic, variable power (30% to 100%)	
Chamber Material	2205 duplex stainless steel	
Flange Size	48 inch AWWA C207, DN1200 24 inch AWWA C207, DN600	36-inch AWWA C207, DN900 12-inch AWWA C207, DN300
Pressure Rating	Up to 150 psi (PN10)	
Sleeve Cleaning	Mechanical cleaning (Optional)	
Network Connection	AB Ethernet I/P, ProfiNet, Profibus, Modbus TCP/IP, Modbus RTU RS485	
Panel Material	Painted mild steel, 304 stainless steel, 316 stainless steel	
Available Oxidants	Hydrogen Peroxide (H <sub>2</sub> O <sub>2</sub> ) and Sodium Hypochlorite (NaOCl)	
Validation	USEPA and NWRI	

\* When you use TrojanUV parts, we guarantee that your system will meet the disinfection requirement specified at purchase, provided that the system's original design parameters haven't changed (e.g., flow rate, UV Transmittance) and maintenance is completed per the UV System O&M manual. Should you experience a disinfection issue, our Service Technicians will work with you to resolve it as fast as possible.

To learn more about the brands and affiliates of Trojan Technologies, please visit [www.trojantechnologies.com](http://www.trojantechnologies.com)



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